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Murrett

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(54) **CREATING A TEXT-EDITABLE WEB PAGE USING A WORD PROCESSOR**

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G06F 17/27	(2006.01)
G06F 17/21	(2006.01)

(52) **U.S. Cl.**

CPC ***G06F 17/24*** (2013.01); ***G06F 17/211*** (2013.01); ***G06F 17/227*** (2013.01); ***G06F 17/2264*** (2013.01); ***G06F 17/272*** (2013.01)

(58) **Field of Classification Search**

USPC 715/234, 229, 236, 239, 253, 271, 276

See application file for complete search history.

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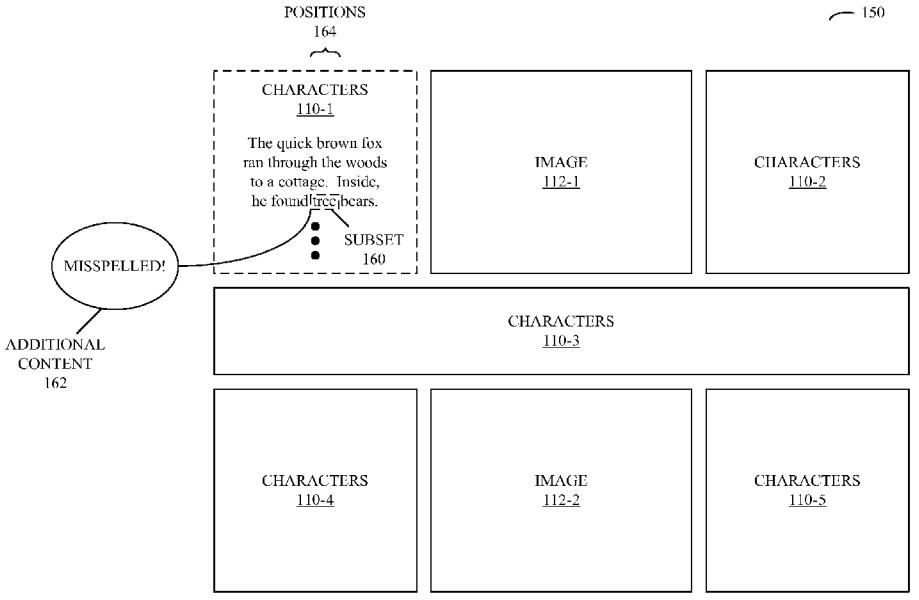
(57) **ABSTRACT**

Embodiments of a method for providing documents, which may be performed by a system, are described. During operation, the system determines presentation information for content in a first document. Note that the content may include characters, and that the presentation information may specify relative positions of the characters in a framework of the first document. Then, the system generates a second document that includes the presentation information. Next, the system outputs a third document that includes the characters in the first document, where the characters can be presented in the framework based solely on the third document using an interpreter program.

19 Claims, 9 Drawing Sheets



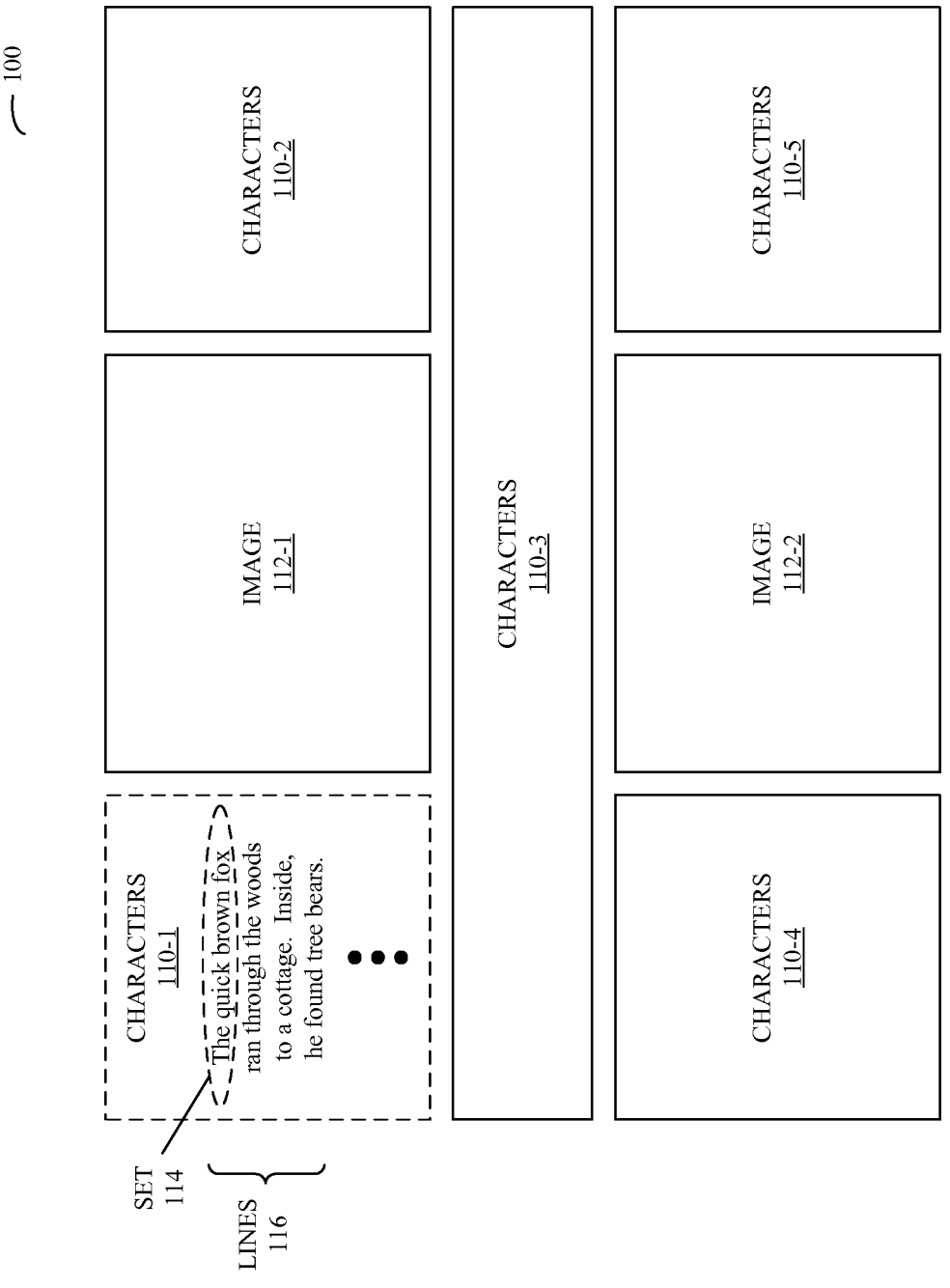

100
CHARACTERS 110-1
The quick brown fox ran through the woods to a cottage. Inside, he found tree bears.
IMAGE 112-1
CHARACTERS 110-2
CHARACTERS 110-3
CHARACTERS 110-4
IMAGE 112-2
CHARACTERS 110-5
SET 114
LINES 116

FIG. 1A

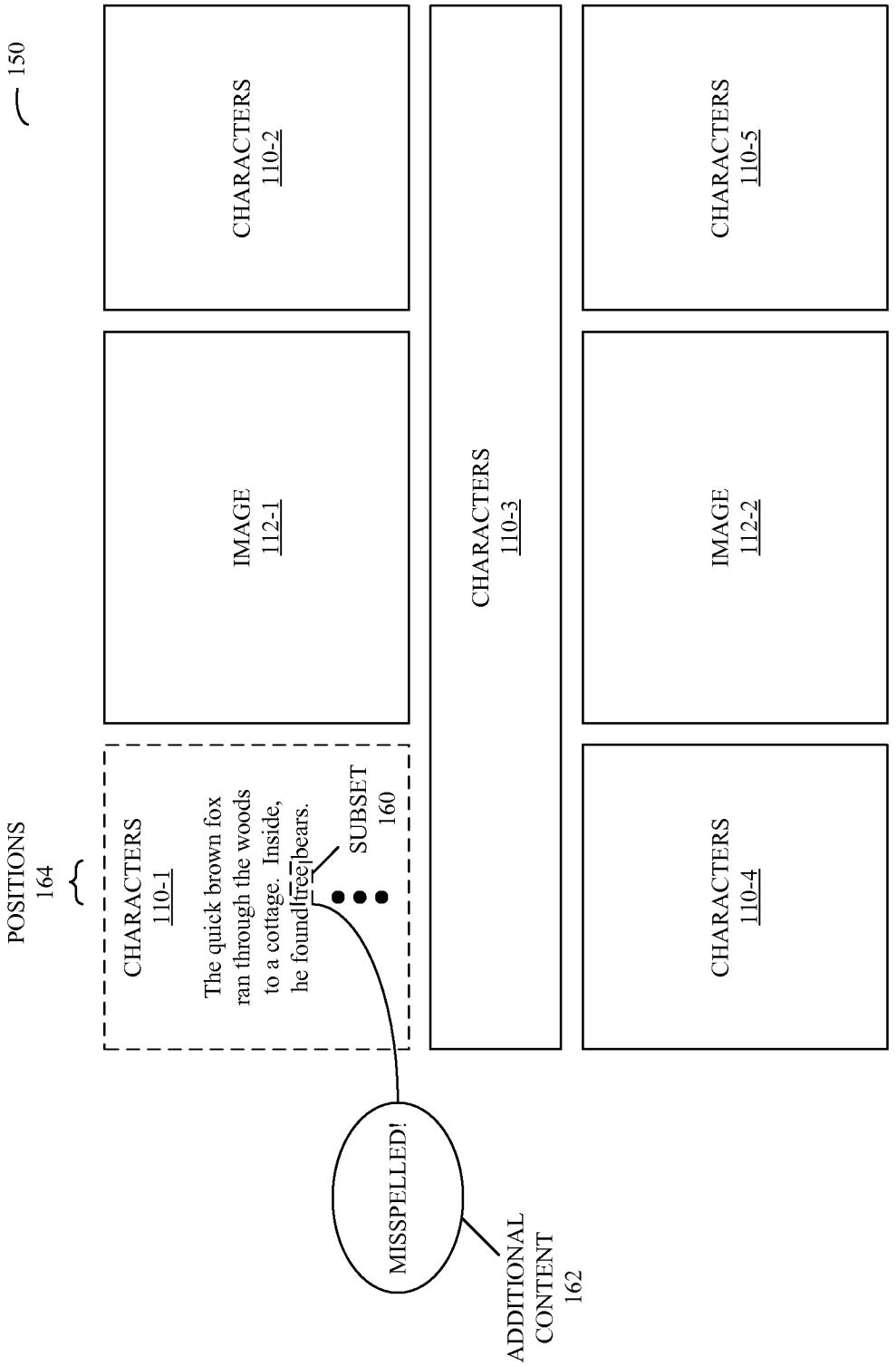

150
CHARACTERS
110-2
IMAGE
112-1
CHARACTERS
110-3
CHARACTERS
110-5
IMAGE
112-2
CHARACTERS
110-4
POSITIONS
164
CHARACTERS
110-1
The quick brown fox ran through the woods to a cottage. Inside, he found three bears.
SUBSET
160
MISSPELLED!
ADDITIONAL CONTENT
162

FIG. 1B

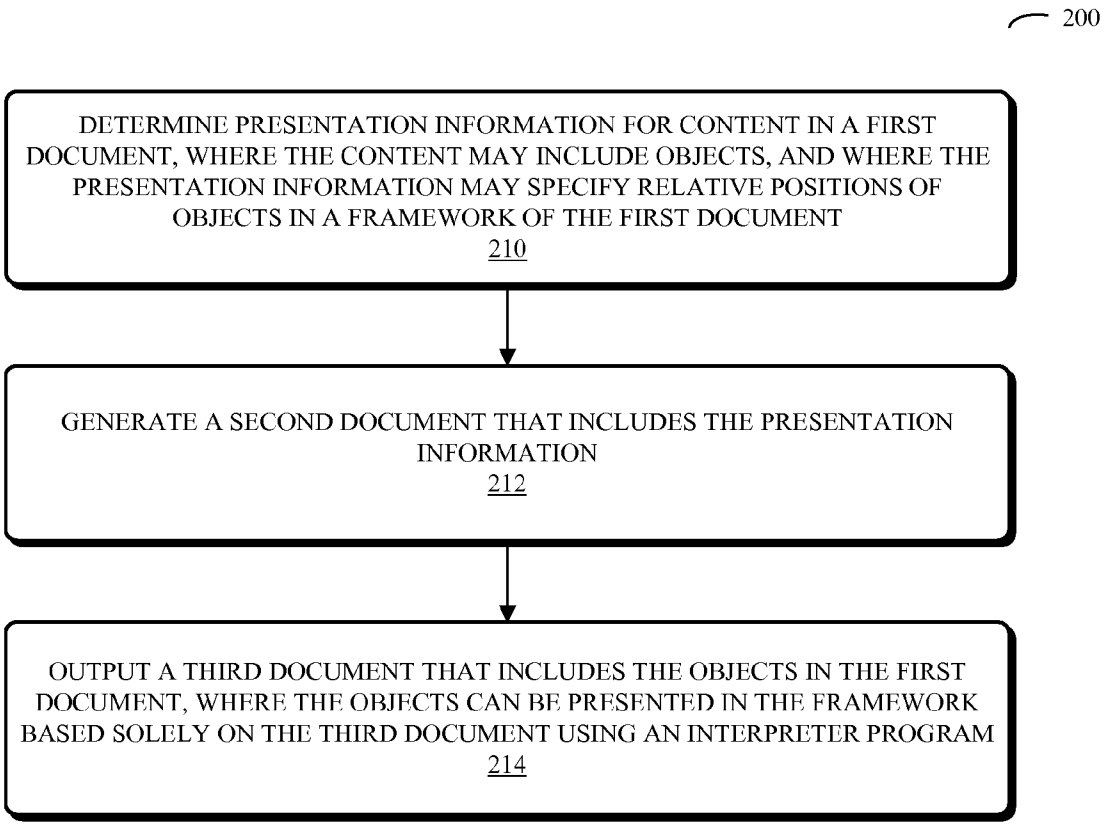

200
DETERMINE PRESENTATION INFORMATION FOR CONTENT IN A FIRST DOCUMENT, WHERE THE CONTENT MAY INCLUDE OBJECTS, AND WHERE THE PRESENTATION INFORMATION MAY SPECIFY RELATIVE POSITIONS OF OBJECTS IN A FRAMEWORK OF THE FIRST DOCUMENT
210
GENERATE A SECOND DOCUMENT THAT INCLUDES THE PRESENTATION INFORMATION
212
OUTPUT A THIRD DOCUMENT THAT INCLUDES THE OBJECTS IN THE FIRST DOCUMENT, WHERE THE OBJECTS CAN BE PRESENTED IN THE FRAMEWORK BASED SOLELY ON THE THIRD DOCUMENT USING AN INTERPRETER PROGRAM
214

FIG. 2

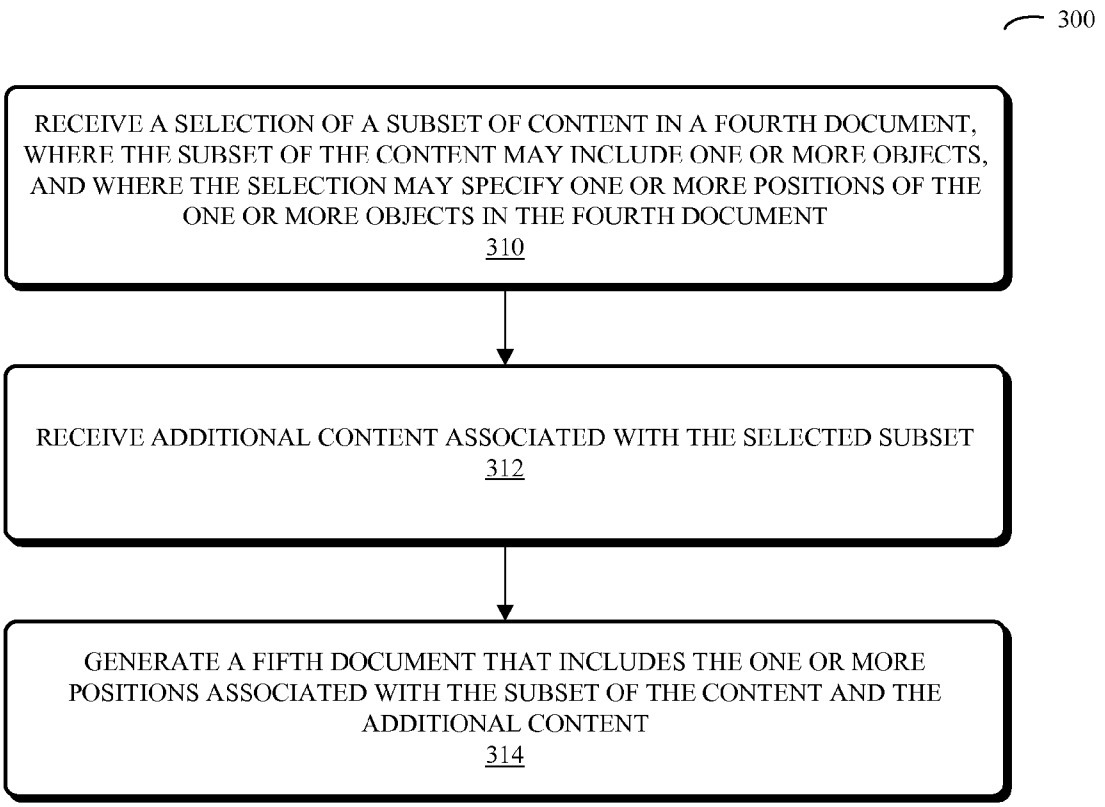

300
RECEIVE A SELECTION OF A SUBSET OF CONTENT IN A FOURTH DOCUMENT, WHERE THE SUBSET OF THE CONTENT MAY INCLUDE ONE OR MORE OBJECTS, AND WHERE THE SELECTION MAY SPECIFY ONE OR MORE POSITIONS OF THE ONE OR MORE OBJECTS IN THE FOURTH DOCUMENT
310
RECEIVE ADDITIONAL CONTENT ASSOCIATED WITH THE SELECTED SUBSET
312
GENERATE A FIFTH DOCUMENT THAT INCLUDES THE ONE OR MORE POSITIONS ASSOCIATED WITH THE SUBSET OF THE CONTENT AND THE ADDITIONAL CONTENT
314

FIG. 3

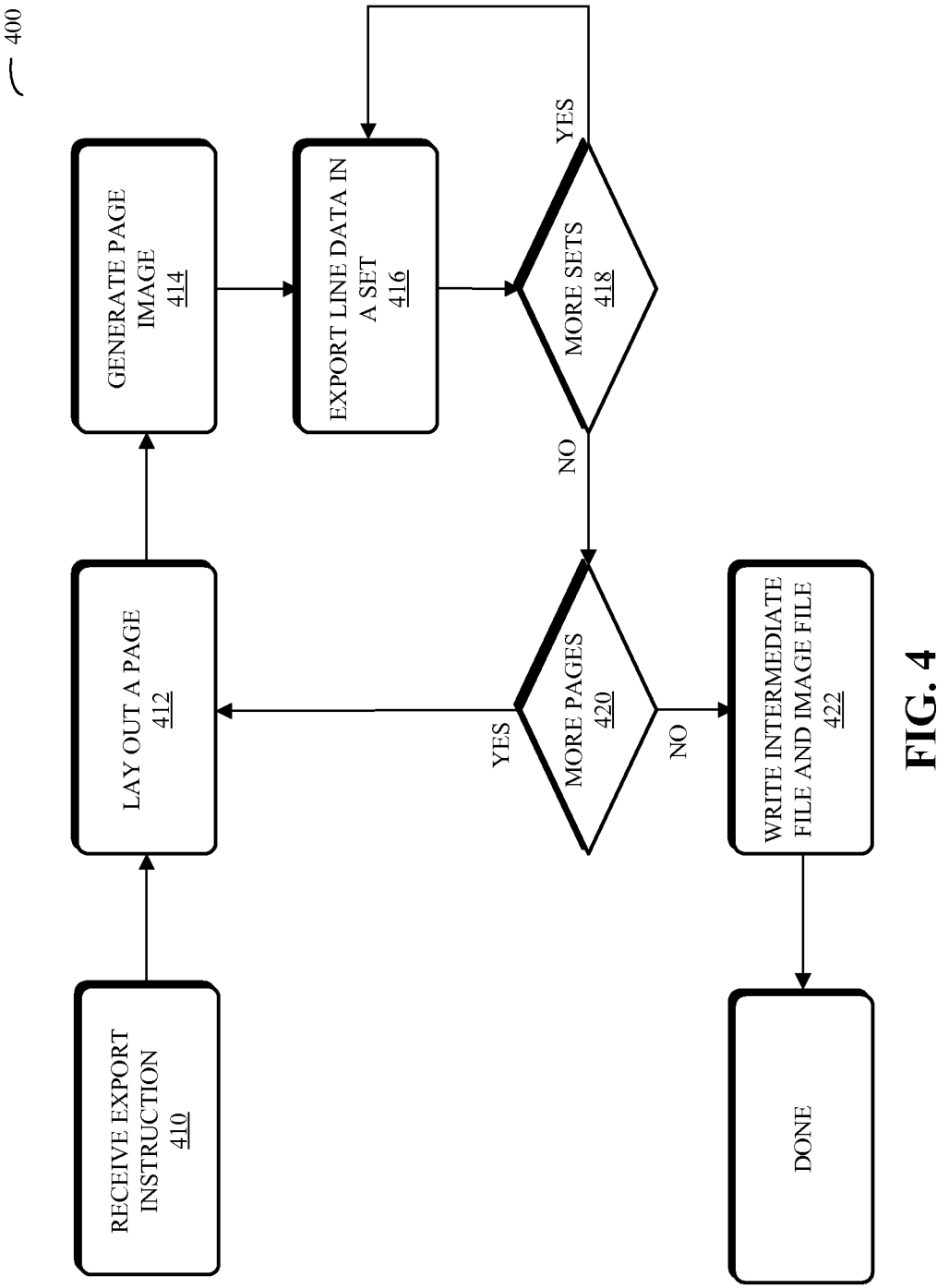

400
RECEIVE EXPORT INSTRUCTION 410
LAY OUT A PAGE 412
GENERATE PAGE IMAGE 414
EXPORT LINE DATA IN A SET 416
MORE SETS 418
YES
NO
MORE PAGES 420
YES
NO
WRITE INTERMEDIATE FILE AND IMAGE FILE 422
DONE

FIG. 4

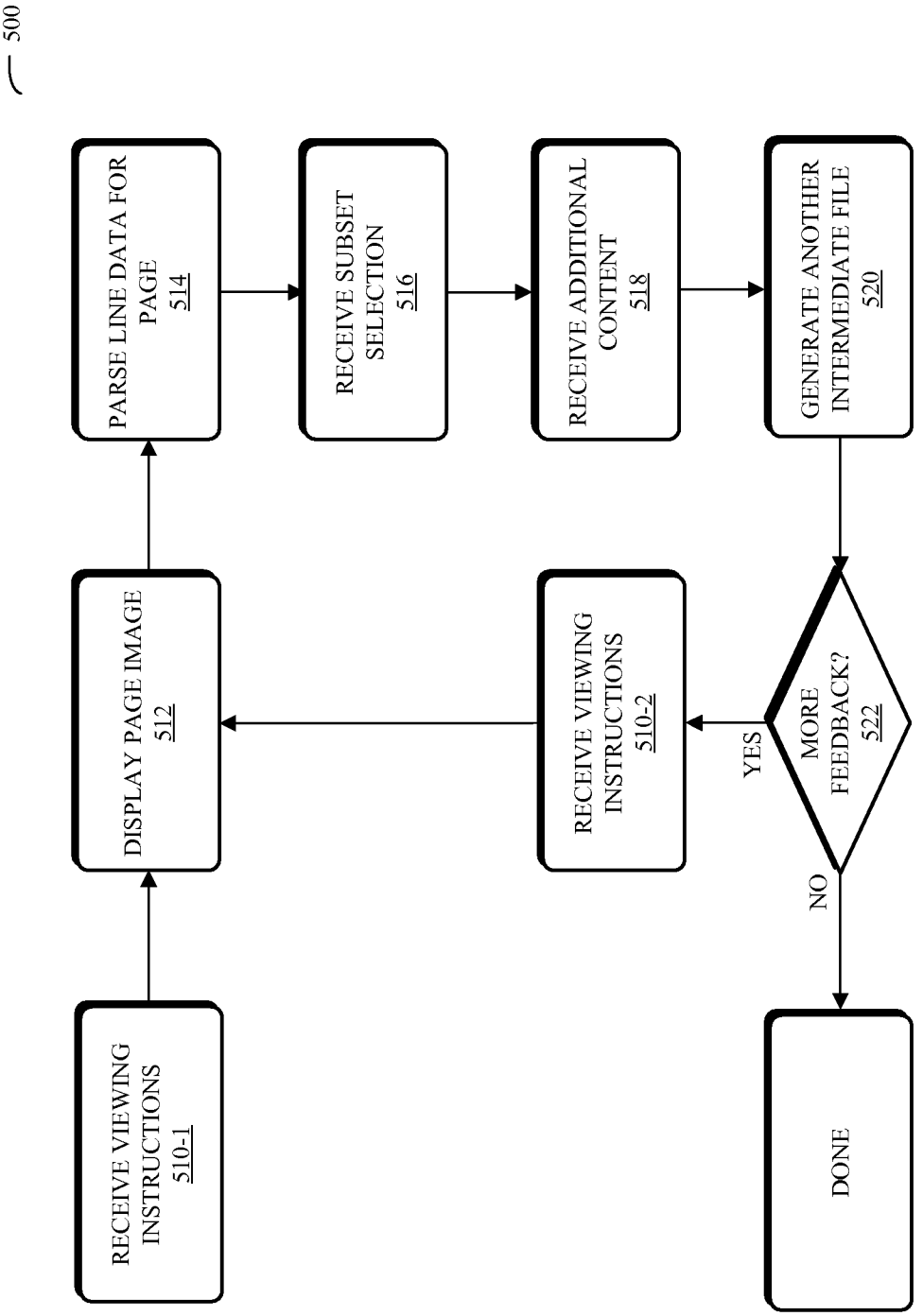

500
RECEIVE VIEWING INSTRUCTIONS 510-1
DISPLAY PAGE IMAGE 512
PARSE LINE DATA FOR PAGE 514
RECEIVE SUBSET SELECTION 516
RECEIVE ADDITIONAL CONTENT 518
GENERATE ANOTHER INTERMEDIATE FILE 520
MORE FEEDBACK? 522
YES
NO
RECEIVE VIEWING INSTRUCTIONS 510-2
DONE

FIG. 5

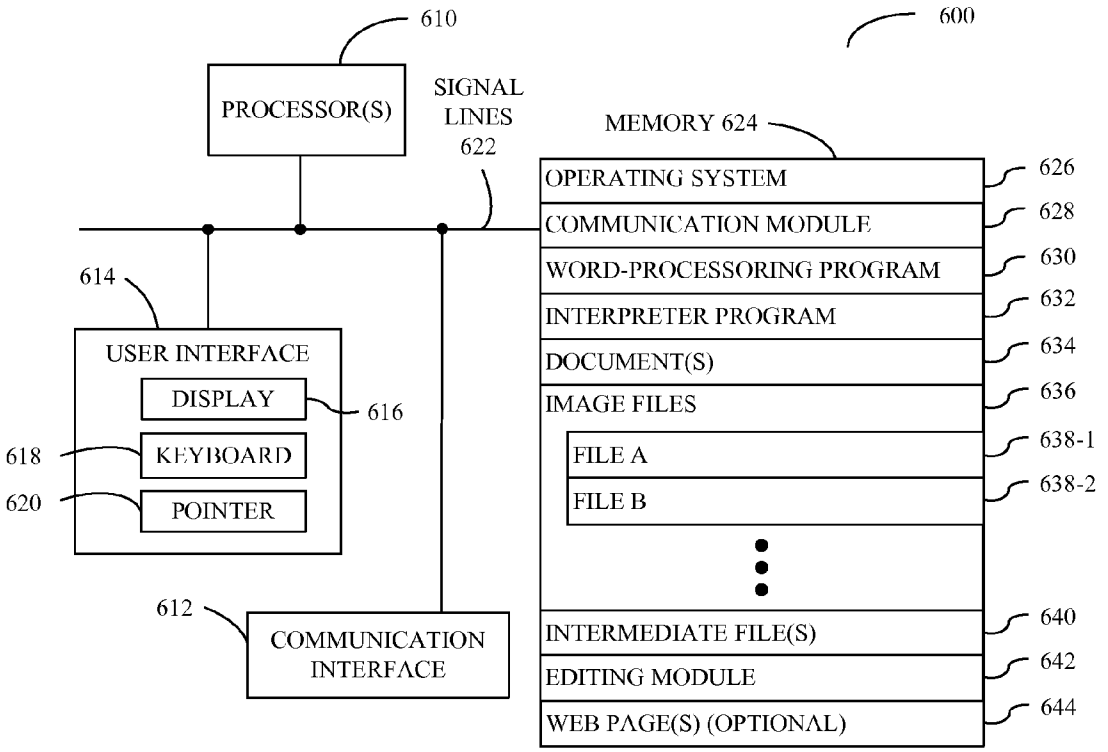

610
600
PROCESSOR(S)
SIGNAL LINES 622
MEMORY 624
OPERATING SYSTEM
626
COMMUNICATION MODULE
628
WORD-PROCESSORING PROGRAM
630
INTERPRETER PROGRAM
632
DOCUMENT(S)
634
IMAGE FILES
636
FILE A
638-1
FILE B
638-2
614
USER INTERFACE
DISPLAY
616
618
KEYBOARD
620
POINTER
612
COMMUNICATION INTERFACE
INTERMEDIATE FILE(S)
640
EDITING MODULE
642
WEB PAGE(S) (OPTIONAL)
644

FIG. 6

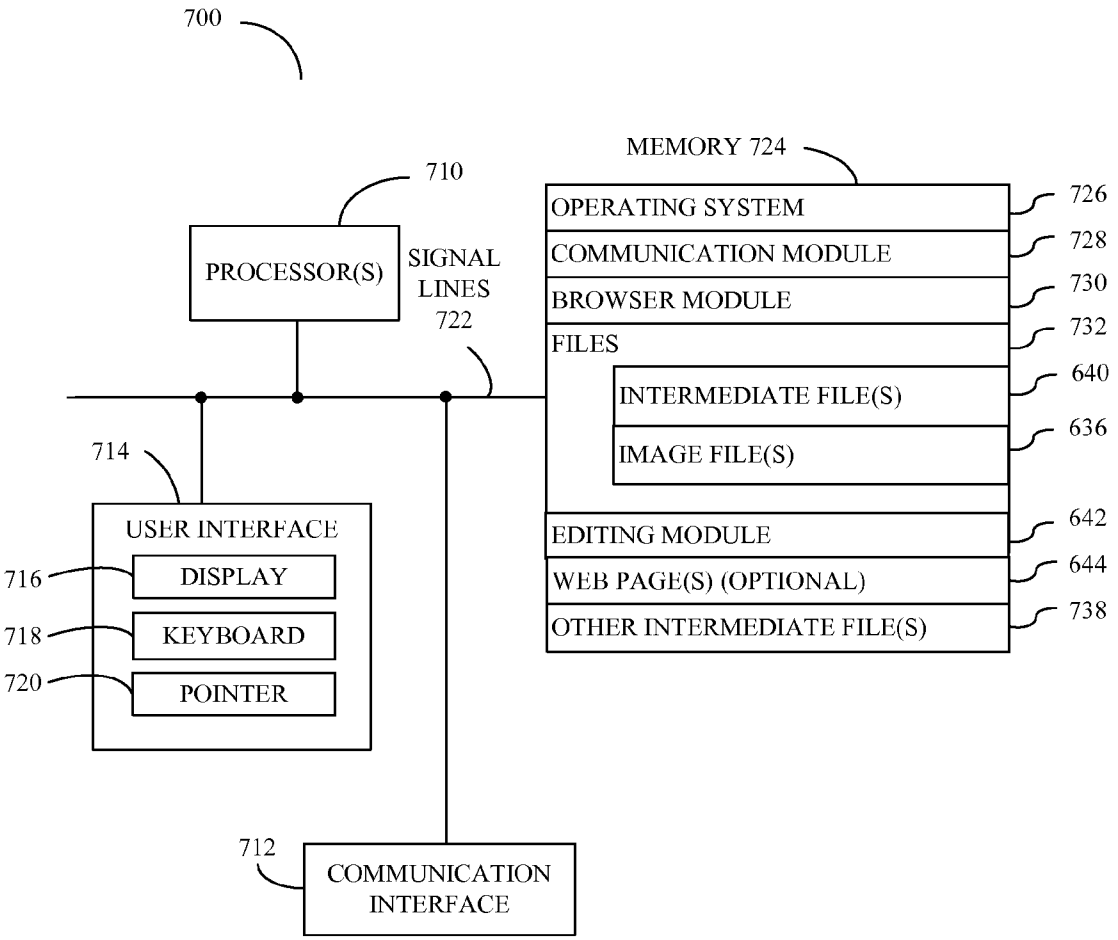

700
MEMORY 724
710
PROCESSOR(S)
SIGNAL LINES
722
OPERATING SYSTEM
726
COMMUNICATION MODULE
728
BROWSER MODULE
730
FILES
732
INTERMEDIATE FILE(S)
640
IMAGE FILE(S)
636
714
USER INTERFACE
DISPLAY
716
KEYBOARD
718
POINTER
720
EDITING MODULE
642
WEB PAGE(S) (OPTIONAL)
644
OTHER INTERMEDIATE FILE(S)
738
712
COMMUNICATION INTERFACE

FIG. 7

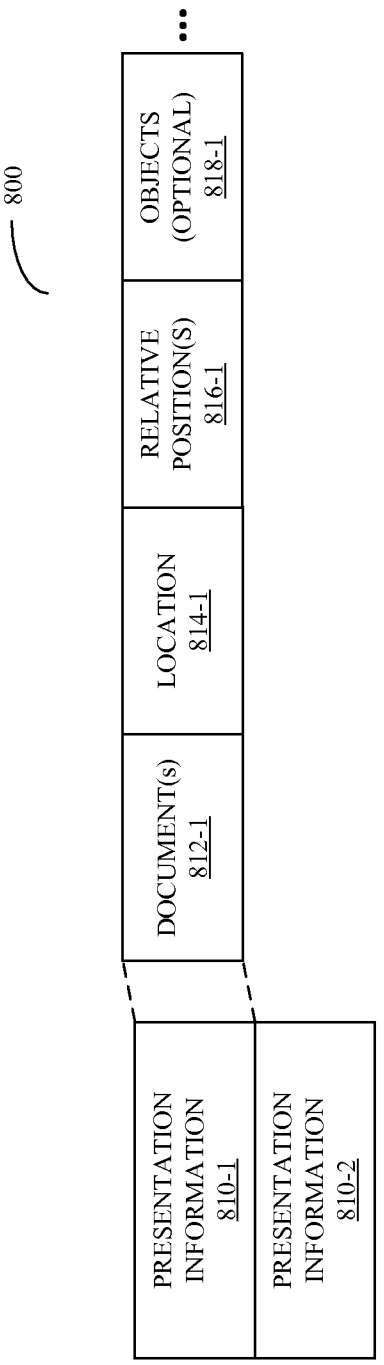

800
PRESENTATION INFORMATION 810-1
PRESENTATION INFORMATION 810-2
DOCUMENT(s) 812-1
LOCATION 814-1
RELATIVE POSITION(S) 816-1
OBJECTS (OPTIONAL) 818-1

FIG. 8

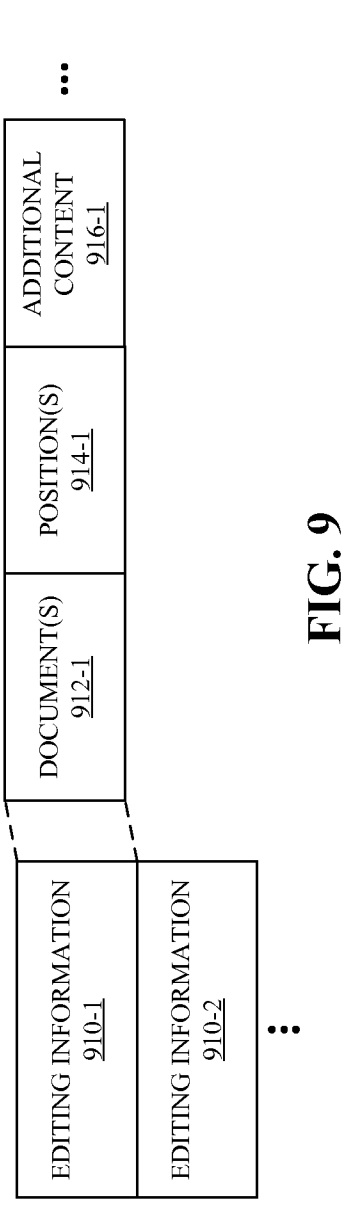

900
EDITING INFORMATION 910-1
EDITING INFORMATION 910-2
DOCUMENT(S) 912-1
POSITION(S) 914-1
ADDITIONAL CONTENT 916-1

FIG. 9

CREATING A TEXT-EDITABLE WEB PAGE USING A WORD PROCESSOR

BACKGROUND

1. Field of the Invention

The present invention relates to techniques for publishing a document. More specifically, the present invention relates to a technique for creating content for a web page using a word processor.

2. Related Art

On-line networks, such as the Internet or World Wide Web (WWW), are increasingly popular forums for exchanging information and communicating with individuals and organizations. For example, many users publish their own web pages to keep in contact with their friends, colleagues and family members.

Moreover, word-processing programs are also widely used to generate documents, which can include a wide variety of content, including text and images. Additionally, these programs provide advanced features, such as tools for integrating text with embedded images in a complicated framework or layout.

Unfortunately, it is currently difficult to use a word-processing program to generate a web page that includes such advanced features because the word-processing program (or a related interpreter program) is typically needed to interpret the framework information in output files from the word-processing program, and this functionality is typically not included in web browsers.

Additionally, it is often difficult for users to interact with a web page to provide comments or feedback on the web-page content.

Hence what is needed is a method and an apparatus that facilitates publishing documents without the above-described problems.

SUMMARY

One embodiment of the present invention provides a method for providing documents, which may be implemented by a system (such as computer system). During operation, the system determines presentation information for content in a first document. Note that the content may include characters, and the presentation information may specify relative positions of the characters in a framework of the first document. Then, the system generates a second document that includes the presentation information. Next, the system outputs a third document that includes the characters in the first document, where the characters can be presented in the framework based solely on the third document using an interpreter program.

In some embodiments, the characters in the second document are grouped in sets of characters, where a given set of characters is associated with a given location in the first document. Note that the given location may include a given line in the first document. Moreover, the relative positions of the characters may include horizontal positions on the given line.

In some embodiments, the framework includes multiple lines.

Additionally, the method may be implemented by a word-processing program, and the first document may include a file associated with the word-processing program.

In some embodiments, the third document includes an image file. For example, the third document: may have a portable document format; may include a bitmap file; and/or may include an electronic book (e-book). Moreover, the third document may include a portion of the presentation information.

In some embodiments, the second document is separate from the third document. Moreover, the second document may facilitate creation of a web page based on the third document. Additionally, the second document may facilitate providing additional content associated with the third document. This additional content may be associated with a subset of the characters in the third document, where the subset may be identified based on the presentation information in the second document. In some embodiments, the additional content is to be provided in an environment associated with a web browser and/or to an application program that is to execute in the environment.

Another embodiment provides the system and/or the computer system.

Another embodiment provides the word-processing program. Moreover, another embodiment provides the web browser.

Another embodiment provides a computer-program product for use in conjunction with the system and/or the computer system. This computer program product may include instructions corresponding to at least some of the aforementioned operations in the method.

Another embodiment provides a data structure stored in a computer-readable storage medium. This data structure may include the presentation information that specifies relative positions of characters in the framework of the first document, where the presentation information facilitates associating the additional content with the subset of content in the third document. Moreover, the third document may include the characters in the first document, and the characters can be presented in the framework based solely on the third document using an interpreter program.

BRIEF DESCRIPTION OF THE FIGURES

FIG. **1**A is a block diagram illustrating a document in accordance with an embodiment of the present invention.

FIG. **1**B is a block diagram illustrating a web page in accordance with an embodiment of the present invention.

FIG. **2** is a flow chart illustrating a process for providing documents in accordance with an embodiment of the present invention.

FIG. **3** is a flow chart illustrating a process for modifying a document in accordance with an embodiment of the present invention.

FIG. **4** is a flow chart illustrating a process for providing documents in accordance with an embodiment of the present invention.

FIG. **5** is a flow chart illustrating a process for modifying a document in accordance with an embodiment of the present invention.

FIG. **6** is a block diagram illustrating a computer system in accordance with an embodiment of the present invention.

FIG. **7** is a block diagram illustrating a client computer in accordance with an embodiment of the present invention.

FIG. **8** is a block diagram illustrating a data structure in accordance with an embodiment of the present invention.

FIG. **9** is a block diagram illustrating a data structure in accordance with an embodiment of the present invention.

Note that like reference numerals refer to corresponding parts throughout the drawings.

DETAILED DESCRIPTION

The following description is presented to enable any person skilled in the art to make and use the invention, and is

provided in the context of a particular application and its requirements. Various modifications to the disclosed embodiments will be readily apparent to those skilled in the art, and the general principles defined herein may be applied to other embodiments and applications without departing from the spirit and scope of the present invention. Thus, the present invention is not intended to be limited to the embodiments shown, but is to be accorded the widest scope consistent with the principles and features disclosed herein.

Embodiments of a computer system, a method, and a computer-program product (i.e., software) for use with the computer system are described. These systems, and/or processes may be used to generate an intermediate file (or a data structure) and an image file from a word-processor document. FIG. **1**A presents a block diagram illustrating a document **100**. This document includes content, such as characters **110** and one or more images **112**, which are arranged in a framework or layout that specifies relative positions of the characters **110** (and which is sometimes referred to as presentation information, semantic information or a context). These characters **110** may be grouped in sets of characters (such as set **114**) that are associated with locations, such as lines **116**, in the document **100**. Note that the framework facilitates advanced features such as column balancing and text that wraps around embedded images **112** (for example, by defining and positioning characters **110** in columns). Typically, the content or presentation information can be presented in the framework when the document **100** is viewed in a word-processor environment.

Alternatively, using only the image file, which can include a portion of the content (such as some of the characters **110**), the portion of the content may be presented in the framework using an interpreter program that is associated with the image file. (Said differently, using only the image file, it may not be possible to present the portion of the content in the framework without the interpreter program because the presentation information has been lost or is no longer in an independently usable form.) Note that the image file may have a variety of formats, including: a portable document format, a bitmap format, a grayscale format, a postscript format, a LaTeX format, and/or an electronic-book (e-book) format.

Unfortunately, it can be difficult to present the content in the framework using applications other than a word-processing program or the interpreter program, such as a web browser. Moreover, this can make it difficult publish or create a web page based on the document **100** or the image file.

As described further below with reference to FIG. **8**, to address this challenge the intermediate file (which may be separate from the image file) may include at least some of the presentation information (such as the relative positions) and/or at least some of one or more of the characters **110**. For example, the intermediate file may include the relative positions (such as horizontal positions) of characters in different lines **116** in the document **100**. This intermediate file may facilitate reconstructing the presentation information or the semantic information in the web page.

In particular, as shown in FIG. **1**B, which presents a block diagram illustrating a web page **150**, using the intermediate file and the image file, a web browser or an application that executes in the environment of a web browser may present at least the portion of the content in the framework in the web page **150**. Note that this web page may be created without using the word-processing program or the interpreter program.

Moreover, a user may be able to edit at least a subset of the content in the web page **150**. In particular, the user may provide additional content **162** associated with at least a subset of the content **160**. For example, the user may select one or more characters by specifying one or more positions **164** in the web page, such as by highlighting a region using a mouse, even though the web page is only an image of the original document **100** (FIG. **1**). (This is because at least the subset may be identified based on the presentation information in the intermediate file.) Then, the user may provide the additional content **162** (such as a comment about a misspelled word) associated with the selected characters in subset **160**.

As described further below with reference to FIG. **9**, another intermediate file (or another data structure) may be generated based on the one or more positions **164** and the associated additional content **162**. This other intermediate file, as well as the intermediate file, may facilitate incorporating the additional content **162** with the content in the image file when the image file is subsequently viewed in the word-processing program.

By generating the intermediate file and the other intermediate file, these techniques may facilitate the creation or publishing of web pages based on documents (such as word-processor documents or documents associated with word-processor documents) and/or may allow changes to the web pages to be incorporated back into the documents. Moreover, these operations may be performed without using an interpreter program or the word-processing program to present the content in the associated framework.

In the discussion that follows, a portable document format may be understood to include a fixed-layout document format that is used to represent two-dimensional or three-dimensional documents in a manner that is independent of the associated application software (such as the word-processing program), hardware, and/or operating system. A file in this format may include text, fonts, images, and/or vector graphics that are included in the document **100** (FIG. **1**). In an exemplary embodiment, the portable document format includes a file format that is compatible with Adobe Acrobat™ software (from Adobe Systems, Inc., of San Jose, Calif.).

Note that information associated with the document, the image file, the intermediate file and the other intermediate file may be received and/or transmitted over a variety of communication networks, such as: the Internet, an intranet, a wired local area network (LAN) (such as IEEE 802.3 or Ethernet), a wireless local area network (LAN) (such as IEEE 802.11 or WiFi), a wide area network (WAN) (such as IEEE 802.16 or WiMAX), a metropolitan area network (MAN), a satellite network, a wireless network (such as a cellular telephone network), an optical network, and/or a combination of networks or other technology that enables communication among computing systems or electronic devices.

We now describe embodiments of a process for publishing documents and a process for modifying a document. FIG. **2** presents a flow chart illustrating a process **200** for providing documents, which may be performed by a computer system or an application executing on the computer system. During operation, the computer system may determine presentation information for content in a first document (**210**). Note that the content may include characters, and that the presentation information may specify relative positions of the characters in a framework of the first document. Then, the computer system may generate a second document (such as the intermediate file) that includes the presentation information (**212**). Next, the computer system may output a third document (such as the image file) that includes the characters in the first document (**214**), where the characters can be presented in the framework based solely on the third document using an interpreter program.

In some embodiments, at least some of the aforementioned operations are performed by a word-processing program. Consequently, the first document may include a file associated with the word-processing program. Alternatively, at least some of the aforementioned operations may be performed by an application that executes in a word-processing environment or by an application that is separate from the word-processing program.

FIG. **3** presents a flow chart illustrating a process **300** for modifying a document, which may be performed by a computer system or an application executing on the computer system. During operation, the computer system may receive a selection of a subset of content in a fourth document (**310**), such as the web page. Note that the subset of the content may include one or more characters, and the selection may specify one or more positions of the one or more characters in the fourth document. Then, the computer system may receive additional content associated with the selected subset (**312**). Next, the computer system may generate a fifth document (such as the other intermediate file) that includes the one or more positions associated with the subset of the content and the additional content (**314**).

As described further below with reference to FIGS. **6** and **7**, in some embodiments at least some of the aforementioned operations are performed by a web browser (e.g., in an environment associated with the web browser) or in an application that executes in the environment of the web browser.

We now describe examples of the process for publishing documents and the process for modifying a document. FIG. **4** presents a flow chart illustrating a process **400** for providing documents, which may be performed by a program executing on computer system, such as word-processing program. During operation, the word-processing program receives an export instruction (**410**) from a user for a document. Next, the word-processing program determines a page layout (**412**) and generates an image of the page (**414**). Then, the word-processing program exports line data in set (**416**), such as a set of characters in a given line in the document.

If there are more sets (**418**), such as if there are additional lines in a given page in the document, the word-processing program may repeat operation (**416**). However, if there are no more sets (**418**), but there are more pages (**420**) in the document, the word-processing program may repeat operations (**412-418**).

Alternatively, if there are no more pages (**420**), the word-processing program may write the intermediate file and the image file (**422**), and process **400** may be completed. For example, the word-processing program may generate an image file having a portable document format. As noted previously, using the intermediate file, another program (for example, a web browser) may subsequently reconstruct one or more characters and/or content in the image file in the appropriate context, such as the framework or layout of the presentation information in the document.

FIG. **5** presents a flow chart illustrating a process **500** for modifying a document, which may be performed by a web browser or a program executing in the environment of a web browser. During operation, the web browser receives viewing instructions (**510-1**) for a web page from a user. Next, the web browser displays a page image (**512**) and parses line data for the page (**514**), for example, using the intermediate file to specify relative positions of characters and/or content in the page image.

Then, the web browser receives a subset selection (**516**), which the user can provide using a mouse. For example, the user may hold down the mouse button while moving the mouse over the subset of the characters in the web page. Moreover, the web browser may receive additional content (**518**) from the user. This additional content may include annotation information associated with the selected subset, such as editing comments. Based on the received subset and the associated additional content, the web browser may generate another intermediate file (**520**).

If the user has more feedback (**522**) on the web page (or other web pages), the web browser may receive another instance of the viewing instructions (**510-2**) for the same web page or another web page, and the web browser may repeat operations (**512-522**). Note that if the additional feedback is associated with the same web page or a different web page, one or more subsequent selected subsets and the associated additional content may be appended to the other intermediate file. However, in some embodiments, if the additional feedback is associated with a different web page, one or more subsequent selected subsets and the associated additional content may be included in another instance of the other intermediate file.

Once the user has finished providing feedback (**522**), process **500** may be completed. As noted previously, using one or more of the instances of the other intermediate file and the image file, another program (for example, the word-processing program) may subsequently import the additional content and present it in context (e.g., in the framework of the presentation information in the document) with the associated subset of characters, thereby allowing users to modify the document based on the additional content.

In some embodiments of processes **200** (FIG. **2**), **300** (FIG. **3**), **400** (FIG. **4**) and **500**, there may be additional or fewer operations. Moreover, the order of the operations may be changed and/or two or more operations may be combined into a single operation.

We now describe embodiments of a computer system that may perform the techniques for publishing one or more documents and modifying a document. FIG. **6** presents a block diagram illustrating a computer system **600**. This computer system includes one or more processors **610**, a communication interface **612**, a user interface **614**, and one or more signal lines **622** coupling these components together. Note that the one or more processing units **610** may support parallel processing and/or multi-threaded operation, the communication interface **612** may have a persistent communication connection, and the one or more signal lines **622** may constitute a communication bus. Moreover, the user interface **614** may include: a display **616**, a keyboard **618**, and/or a pointer **620**, such as a mouse.

Memory **624** in the computer system **600** may include volatile memory and/or non-volatile memory. More specifically, memory **624** may include: ROM, RAM, EPROM, EEPROM, Flash, one or more smart cards, one or more magnetic disc storage devices, and/or one or more optical storage devices. Memory **624** may store an operating system **626** that includes procedures (or a set of instructions) for handling various basic system services for performing hardware-dependent tasks. While not explicitly indicated in the computer system **600**, in some embodiments the operating system **626** includes a web browser, such as: Internet Explorer™ (from Microsoft Corporation, of Redmond, Wash.), Safari™ (from Apple Inc., of Cupertino, Calif.), and/or Firefox (from the Mozilla Foundation, of Mountain View, Calif.). Additionally, memory **624** may store procedures (or a set of instructions) in a communication module **628**. These communication procedures may be used for communicating with one or more computers and/or servers, including computers and/or servers that are remotely located with respect to the computer system **600**.

Memory **624** may also include multiple program modules (or a set of instructions), including: word-processing program **630** (or a set of instructions), interpreter program **632** (or a set of instructions), and/or editing module **642** (or a set of instructions). Using word-processing program **630**, a user may generate one or more image files **636** (such as file A **638-1** or file B **638-2**) and one or more intermediate files **640** from one or more of documents **634**. Note that, based solely on a given image file (such as file A **638-1**), characters can be presented in the appropriate context (such as the framework or layout of the corresponding word-processor document) using interpreter program **632**.

As noted previously, the one or more image files **636** and the one or more intermediate files **640** may be used by another program, such as a web browser, to generate optional web pages **644**. These web pages may provide characters and/or content in the given image file in the appropriate context (e.g., the presentation information in an associated document, such as one of the documents **634**). Additionally, using the editing module **642**, the user may select a subset of the characters in a given web page and provide additional content. As described below with reference to FIG. **7**, in some embodiments the editing module **642** and/or the optional web pages **644** may be stored on a client computer in addition to and/or instead of computer system **600**.

Instructions in the various modules in the memory **624** may be implemented in: a high-level procedural language, an object-oriented programming language, and/or in an assembly or machine language. Note that the programming language may be compiled or interpreted, e.g., configurable or configured to be executed by the one or more processing units **610**.

Although the computer system **600** is illustrated as having a number of discrete components, FIG. **6** is intended to be a functional description of the various features that may be present in the computer system **600** rather than a structural schematic of the embodiments described herein. In practice, and as recognized by those of ordinary skill in the art, the functions of the computer system **600** may be distributed over a large number of servers or computers, with various groups of the servers or computers performing particular subsets of the functions. In particular, as described further below with reference to FIG. **7**, some of the modules in memory **624** may be performed by a web browser or by an application that executes in the environment of the web browser at a client computer.

In some embodiments, some or all of the functionality of the computer system **600** may be implemented in one or more application-specific integrated circuits (ASICs) and/or one or more digital signal processors (DSPs).

Computer system **600** may include fewer components or additional components. Moreover, two or more components may be combined into a single component and/or a position of one or more components may be changed. Note that in some embodiments the functionality of the computer system **600** may be implemented more in hardware and less in software, or less in hardware and more in software, as is known in the art. In some embodiments, one or more files or data structures in computer system **600** are encrypted and/or compressed.

FIG. **7** is a block diagram illustrating a client computer **700**, which may be coupled to computer system **600** (FIG. **6**) by a network, such as the Internet. Client computer **700** may include: one or more processors **710**, a communication interface **712** for communicating with other computers, servers and/or clients (such as computer system **600** in FIG. **6**), a user interface **714**, a memory **724**, and one or more signal lines **722** for coupling these components to one another. Note that the one or more processing units **710** may support parallel processing and/or multi-threaded operation, the communication interface **712** may have a persistent communication connection, and the one or more signal lines **722** may constitute a communication bus. Moreover, the user interface **714** may include: a display **716**, a keyboard **718**, and/or a pointer **720**, such as a mouse.

Memory **724** in the client computer **700** may include volatile memory and/or non-volatile memory. More specifically, memory **724** may include: ROM, RAM, EPROM, EEPROM, Flash, one or more smart cards, one or more magnetic disc storage devices, and/or one or more optical storage devices. Memory **724** may store an operating system **726** that includes procedures (or a set of instructions) for handling various basic system services for performing hardware-dependent tasks. Additionally, memory **724** may store procedures (or a set of instructions) in a communication module **728**. These communication procedures may be used for communicating with one or more computers and/or servers, including computers and/or servers that are remotely located with respect to the client computer **700**.

Memory **724** may also include multiple program modules (or a set of instructions), including: a browser module **730** (or a set of instructions) and the editing module **642**. Note that browser module **730** may include: Internet Explorer™ (from Microsoft Corporation, of Redmond, Wash.), Safari™ (from Apple Inc., of Cupertino, Calif.), and/or Firefox (from the Mozilla Foundation, of Mountain View, Calif.)

During operation, browser module **730** may provide optional web pages **644** based on one or more files **732**, such as one or more intermediate files **640** and one or more image files **636**. In this way, browser module **730** may present at least a portion of the presentation information in associated documents **634** (FIG. **6**) in the optional web pages **644** (e.g., the characters in a given image file may be presented in the appropriate context, such as the framework or layout of a given word-processor document).

Moreover, using editing module **642**, a user may provide feedback on the optional web pages **644**. For example, using pointer **720**, the user may select a subset of the characters in a given web page, and may provide additional content associated with the selected subset. Then, editing module **642** may generate one or more other intermediate files **738**. These files may include a range of positions in the given web page, which are associated with the selected subset, and the associated additional content. As noted previously, the additional information may be subsequently presented in context in the word-processing program **630** (FIG. **6**) based on the one or more other intermediate files **738** and the one or more image files **636**.

Note that client computer **700** may include fewer components or additional components. For example, in embodiments where the client computer **700** is coupled to a local server, one or more of the modules and/or applications in the memory **724** may be stored in a server computer at a different location than the user.

In some embodiments, the editing module **642** is resident on the client computer **700**. However, other embodiments may utilize an editing tool that is embedded in a web page (for example, as a stand-alone application or as a portion of another application). This web page may be provided by computer system **600** (FIG. **6**) via a network, such as the Internet. In an illustrative embodiment, the editing tool is a software package written in: JavaScript™ (which is a trademark of Sun Microsystems, Inc., of Santa Clara, Calif.), e.g., the editing tool includes programs or procedures containing JavaScript instructions, ECMAScript (the specification for

which is published by the European Computer Manufacturers Association International), VBScript™ (a trademark of Microsoft, Inc.) or any other client-side scripting language. In other words, the embedded editing tool may include programs or procedures containing: JavaScript, ECMAScript instructions, VBScript instructions, or instructions in another programming language suitable for rendering by the browser module **730** or another client application on the client computer **700**.

Moreover, two or more components may be combined into a single component and/or a position of one or more components may be changed. As an illustration, in some embodiments the editing module **642** may be integrated into the browser module **730**.

We now discuss data structures that may be used in the computer system **600** (FIG. **6**) and/or the client computer **700**. FIG. **8** presents a block diagram illustrating a data structure **800**, which may be included in one of the intermediate files. This data structure may include a line data structure associated with the presentation information in lines **116** (FIG. **1**A). For example, presentation information **810-1** may include: one or more associated documents **812-1** (such as a word-processor document or an image file), location **814-1** (such as one of the lines **116** in FIG. **1**A), one or more relative positions **816-1** (such as one or more horizontal positions or offset distances in one of the lines **116** in FIG. **1**A), and/or one or more optional characters **818-1** that are at the relative positions **816-1** in the one or more associated documents **812-1**. In this way, data structure **800** may specify the presentation information **810**, such as the relative positions **816** of optional characters **818** in the framework of the one or more associated documents **812-1**.

FIG. **9** presents a block diagram illustrating a data structure **900** which may be included in one of the other intermediate files. This data structure may include editing information **910** for a web page that is based on one or more image files and one or more intermediate files, such as an intermediate file corresponding to data structure **800** (FIG. **8**). For example, editing information **910-1** may include: one or more associated documents **912-1** (such as one or more image files), one or more positions **914-1** (such as a range of positions in the one or more image files associated with a user-selected subset of characters), and/or associated additional content **916-1** (such as annotation information). In this way, data structure **900** may allow a user to specify relative positions in a text string (or an image of a text string), thereby allowing the user to provide the additional content **916** for subsequent incorporation and/or use in the word-processing program **630** (FIG. **6**).

Note that that in some embodiments of the data structures **800** (FIG. **8**) and **900** there may be fewer or additional components. Moreover, two or more components may be combined into a single component and/or a position of one or more components may be changed.

While the preceding embodiments have used documents and word-processing programs as illustrative examples, the process for publishing documents and the process for modifying the document may be used with a wide variety of document types and/or applications. For example, in other embodiments a publisher may intentionally strip or remove at least some of the presentation information from a document. This may occur when an e-book is generated. However, even though at least some of the context or semantic information has been removed from the e-book, one or more intermediate files may provide the necessary context information to another program, such as an e-book reader, which may allow users to read the e-book and/or to provide annotation information (for example, via one or more of the other intermediate files).

The foregoing descriptions of embodiments of the present invention have been presented for purposes of illustration and description only. They are not intended to be exhaustive or to limit the present invention to the forms disclosed. Accordingly, many modifications and variations will be apparent to practitioners skilled in the art. Additionally, the above disclosure is not intended to limit the present invention. The scope of the present invention is defined by the appended claims.

What is claimed is:

1. A method for providing documents, the method comprising:

receiving, with a user interface of a computing device, content and a layout of the content, the content including characters and one or more images;

generating a word processing document including the content, wherein a word processing program executing on the computing device uses the layout to generate the word processing document;

determining presentation information for the content, wherein the presentation information specifies positions of the characters relative to the one or more images in the layout of the word processing document;

generating, with the word processing program, an intermediate file that includes the presentation information, wherein the intermediate file facilitates reconstructing the layout of content with a web browser; and

generating, with the word processing program, an image file that includes portions of the content, wherein the image file and the intermediate file can be used by an interpreter program to generate a web page that reflects the content and the layout of the content.

2. The method of claim **1**, wherein the intermediate file facilitates reconstructing the layout of the content in the web browser without using the word processing program.

3. The method of claim **1**, wherein the intermediate file facilitates providing additional content associated with the image file.

4. The method of claim **3**, wherein the additional content is associated with a subset of the characters in the image file, and the subset is identified based on the presentation information in the intermediate file.

5. The method of claim **3**, wherein the additional content is provided in an environment associated with a web browser.

6. The method of claim **1**, wherein the image file has one of the following formats: a portable document format, a bitmap format, a grayscale format, a postscript format, a LaTeX format, or an electronic-book (e-book) format.

7. The method of claim **1**, wherein the characters in the intermediate file are grouped in sets of characters and a given set of characters is associated with a given location in multiple locations in the word processing document.

8. The method of claim **7**, wherein the multiple locations include multiple lines and the given location includes a given line in the multiple lines.

9. The method of claim **8**, wherein relative positions of characters in the given set of characters include horizontal positions on the given line.

10. The method of claim **1**, further comprising:

displaying, on the computing device, the content in a web browser environment using the intermediate file and the image file;

receiving a selection of a subset of one or more characters of the content from a user in the web browser environment;

receiving additional content from the user in the web browser environment; and

generating a second intermediate file with editing information, wherein the editing information includes the one or more image files, the subset, and the additional content.

11. The method of claim **10**, wherein the second intermediate file facilitates incorporating the additional content with the content when the word processing document is subsequently viewed in the word processing program.

12. A non-transitory computer readable storage medium configured to store instructions that, when executed by a processor included in a computing device, cause the computing device to carry out steps that include:

receiving, with a user interface of a computing device, content and a layout of the content, the content including characters and one or more images;

generating a word processing document including the content, wherein a word processing program executing on the computing device uses the layout to generate the word processing document;

determining presentation information for the content, wherein the presentation information specifies positions of the characters relative to the one or more images in the layout of the word processing document;

generating an intermediate file that includes the presentation information, wherein the intermediate file facilitates reconstructing the layout of content with a web browser; and

generating an image file that includes portions of the content, wherein the image file and the intermediate file can be used by an interpreter program to generate a web page that reflects the content and the layout of the content.

13. The non-transitory computer readable storage medium of claim **12**, wherein the intermediate file facilitates reconstructing the layout of the content in the web browser without using the word processing program.

14. The non-transitory computer readable storage medium of claim **12**, wherein the characters in the intermediate file are grouped in sets of characters, and a given set of characters is associated with a given location in multiple locations in the word processing document.

15. The non-transitory computer readable storage medium of claim **14**, wherein the multiple locations include multiple lines, and the given location includes a given line in the multiple lines.

16. The non-transitory computer readable storage medium of claim **15**, wherein relative positions of characters in the given set of characters include horizontal positions on the given line.

17. A computing device, comprising:

a processor configured to carry out steps that include:

receiving, with a user interface of the computing device, content and a layout of the content, the content including characters and one or more images;

generating a word processing document including the content, wherein a word processing program executing on the computing device uses the layout to generate the word processing document;

determining presentation information for the content, wherein the presentation information specifies positions of characters relative to the one or more images in the layout of the word processing document;

generating an intermediate file that includes the presentation information, wherein the intermediate file facilitates reconstructing the layout of content with a web browser; and

generating an image file that includes portions of the content, wherein the image file and the intermediate file can be used by an interpreter program to generate a web page that reflects the content and the layout of the content.

18. The computing device of claim **17**, wherein the intermediate file facilitates reconstructing the layout of the content in the web browser without using the word processing program.

19. The computing device of claim **17**, wherein the characters in the intermediate file are grouped in sets of characters, and a given set of characters is associated with a given location in multiple locations in the word processing document.

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